

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A method for determining the operating health of a hydraulic system, the method comprising the steps of:

determining a plurality of operating parameters of the hydraulic system during operation of the hydraulic system;

determining an estimated working condition value of the hydraulic system;

modifying the estimated working condition value as a function of the operating parameters; and

determining the operating health of the hydraulic system as a function of the a modified estimated working condition value.

2. (Original) The method of claim 1, wherein the working condition value is indicative of an effective bulk modulus value of at least part of the hydraulic system.

3. (Original) The method of claim 1, wherein the working condition value is indicative of a cavitation or entrapped air condition within the hydraulic system.

4. (Original) The method of claim 1, wherein the working condition value is indicative of an amount of leakage within at least part of the hydraulic system.

5. (Original) The method of claim 1, further comprising determining at least a second working condition value as a function of one or more of the operating parameters.

6. (Original) The method of claim 5, wherein:
at least one of the working condition values is indicative of an effective bulk modulus value of at least part of the hydraulic system; and
at least another of the working condition values is indicative of an amount of leakage within at least part of the hydraulic system.

7. (Original) The method of claim 5, wherein:
at least one of the working condition values is indicative of a cavitation or entrapped air condition within at least part of the hydraulic system; and
at least another of the working condition values is indicative of an amount of leakage within at least part of the hydraulic system.

8. (Original) The method of claim 1, wherein:
the step of determining operating parameters includes determining an operating pressure of a fluid drive member; and
the estimated working condition value is modified as a function of the operating pressure of the fluid drive member.

9. (Original) The method of claim 8, wherein:

the step of determining operating parameters includes determining an operating speed of a fluid drive member; and

the estimated working condition value is modified as a function of the operating speed of the fluid drive member.

10. (Original) The method of claim 1, wherein:

the step of determining operating parameters includes determining operating pressures of first and second fluid drive members; and

the estimated working condition value is modified as a function of the operating pressures of the first and second fluid drive members.

11. (Original) The method of claim 10, wherein:

the step of determining operating parameters includes determining an operating speed of the first fluid drive member and determining an operating speed of the second fluid drive member; and

the estimated working condition value is modified as a function of the operating speed of the first fluid drive member and as a function of the operating speed of the second fluid drive member.

12. (Original) The method of claim 11, wherein the step of determining operating parameters includes determining a swashplate angle; and

the estimated working condition value is modified as a function of the swashplate angle.

13. (Original) The method of claim 1, further comprising:
comparing the working condition value to one or more predetermined working condition values; and
determining the operating health of the hydraulic system as a function of the working condition value and the one or more predetermined working condition values.

14. (Original) The method of claim 1, further comprising:
determining a plurality of working condition values over a period of time;
and
evaluating the working condition values to detect or predict a change in the operating health of the hydraulic system.

15. (Original) The method of claim 1, wherein:
the step of determining a plurality of operating parameters includes determining a reference operating parameter; and
the step of modifying the estimated working condition value includes modifying the estimated working condition value as a function of the reference operating parameter.

16. (Original) The method of claim 15, further including:

determining a model operating parameter as a function of the estimated working condition value;

wherein the step of modifying the estimated working condition value includes modifying the estimated working condition value as a function of the relationship between the model operating parameter and the reference operating parameter.

17. (Original) The method of claim 16, wherein the step of determining a model operating parameter includes determining a model operating parameter as a function of one or more of the operating parameters.

18. (Original) The method of claim 16, further comprising repeating the step of modifying the estimated working condition value until the model operating parameter bears a desired relationship with the reference operating parameter.

19 - 30. (Cancelled).

31. (New) A method for determining the operating health of a hydraulic system comprising:

measuring at least one operating parameter of the hydraulic system;

predicting a working condition of the hydraulic system;

adjusting the predicted working condition;

determining the operating health of the system at least partially based on the adjusted working condition.

32. (New) The method of claim 31, wherein:
predicting the working condition includes estimating a working condition of the hydraulic system at least partially based on a preferred value.

33. (New) The method of claim 31, wherein adjusting the predicted working condition includes:
calculating a model operating parameter at least partially based on the predicted working condition; and
comparing the model operating parameter to the measured working condition.

34. (New) The method of claim 31, wherein the predicted working condition is the effective bulk modulus of the hydraulic system.